

# The Efficacy of “Distant Healing”: A Systematic Review of Randomized Trials

John A. Astin, PhD; Elaine Harkness, BSc; and Edzard Ernst, MD, PhD

**Purpose:** To conduct a systematic review of the available data on the efficacy of any form of “distant healing” (prayer, mental healing, Therapeutic Touch, or spiritual healing) as treatment for any medical condition.

**Data Sources:** Studies were identified by an electronic search of the MEDLINE, PsychLIT, EMBASE, CISCOM, and Cochrane Library databases from their inception to the end of 1999 and by contact with researchers in the field.

**Study Selection:** Studies with the following features were included: random assignment, placebo or other adequate control, publication in peer-reviewed journals, clinical (rather than experimental) investigations, and use of human participants.

**Data Extraction:** Two investigators independently extracted data on study design, sample size, type of intervention, type of control, direction of effect (supporting or refuting the hypothesis), and nature of the outcomes.

**Data Synthesis:** A total of 23 trials involving 2774 patients met the inclusion criteria and were analyzed. Heterogeneity of the studies precluded a formal meta-analysis. Of the trials, 5 examined prayer as the distant healing intervention, 11 assessed noncontact Therapeutic Touch, and 7 examined other forms of distant healing. Of the 23 studies, 13 (57%) yielded statistically significant treatment effects, 9 showed no effect over control interventions, and 1 showed a negative effect.

**Conclusions:** The methodologic limitations of several studies make it difficult to draw definitive conclusions about the efficacy of distant healing. However, given that approximately 57% of trials showed a positive treatment effect, the evidence thus far merits further study.

The widespread use of complementary and alternative medicine (CAM), commonly defined as therapies that are “neither taught widely in U.S. medical schools nor generally available in U.S. hospitals” (1), is now well documented. Results of several national surveys in the United States and elsewhere suggest that up to 40% of the adult population has in the preceding year used some form of CAM to treat health-related problems (1–5). In part because of the increasing use of CAM by the public, there has been a greater sense of urgency and motivation on the part of the scientific community to study the safety and efficacy of these therapies.

A belief in the role of mental and spiritual factors in health is an important predictor of CAM use (2). In a recent study of CAM in the United States (1), 7% of persons surveyed reported having tried some form of “spiritual healing.” This was the fifth most frequently used treatment among all CAM therapies assessed. In the same study, 35% of persons surveyed reported that they had used prayer to address their health-related problems. A national survey conducted in the United States in 1996 found that 82% of Americans believed in the healing power of prayer and 64% felt that physicians should pray with patients who request it (6). Although not without its critics (7), a growing body of evidence suggests an association between religious involvement and spirituality and positive health outcomes (8–11).

*Spiritual healing* is a broad classification of approaches involving “the intentional influence of one or more persons upon another living system without utilizing known physical means of intervention” (12). Following the example of Sicher and colleagues (13), we use the term *distant healing* in our review. Although it does not necessarily imply any particular belief in or referral to a deity or higher power, distant (or distance) healing encompasses spiritual healing, prayer, and their various derivatives and has been defined as “a conscious, dedicated act of mentation attempting to benefit another person’s physical or emotional well being at a distance” (13). As we define it here, distant healing includes strategies that purport to heal through some exchange or channeling of supraphysical energy. Such approaches include Therapeutic Touch, Reiki healing, and external qigong. Although they do not necessitate actual physical contact, these

healing techniques usually involve close physical proximity between practitioner and patient. Distant healing also includes approaches commonly referred to as “prayer.” Prayer, whether directed toward health-related matters or other areas of life, includes several variants: intercessory prayer (asking God, the universe, or some higher power to intervene on behalf of an individual or patient); supplication, in which one asks for a particular outcome; and nondirected prayer, in which one does not request any specific outcome (for example, “Thy will be done . . .”).

All forms of distant healing are highly controversial. Despite several positive reviews examining the research on these techniques (12–14), there continue to be conflicting claims in the literature regarding their clinical efficacy (7, 15, 16). In the absence of any plausible mechanism, skeptics are convinced that the benefits being reported are due to placebo effects at best or fraud at worst. Notwithstanding this ongoing controversy, distant healing techniques are increasing in popularity. For example, in the United Kingdom today, there are more distant healers (about 14 000) than there are therapists from any other branch of CAM. This level of popularity makes examination of the available evidence relevant. The objective of our systematic review was to summarize all available randomized clinical trials testing the efficacy of all forms of distant healing as a treatment for any medical condition.

## Methods

A comprehensive literature search was conducted to identify studies of distant healing (spiritual healing, mental healing, faith healing, prayer, Therapeutic Touch, Reiki, distant healing, psychic healing, and external qigong). The MEDLINE, PsychLIT, EMBASE, CISCOM, and Cochrane Library databases were searched from their inception to the end of 1999. The search terms used were the above-named forms of treatment plus *clinical trials*, *controlled clinical trials*, and *randomized controlled trials*. In addition, we contacted leading researchers in the fields of distant and spiritual healing to further identify studies. We also searched our own files and the reference sections of articles on distant healing that we identified. Numerous studies have been carried out in these areas—for example, in a review of spiritual healing, Benor (12) identified 130 controlled investigations, and Rosa and colleagues (15) identified 74 “quantitative studies” of Therapeutic Touch. However, we included only studies that met the following criteria: 1) random assignment of study participants; 2) placebo, sham, or otherwise “patient-blindable” or adequate control interventions; 3) publication in peer-reviewed journals (ex-

cluding published abstracts, theses, and unpublished articles); 4) clinical (rather than experimental) investigations; and 5) study of humans with any medical condition.

We did not apply restrictions on the language of publication. The methodologic quality of studies was assessed by using the criteria outlined by Jadad and colleagues (17). In addition, we examined the extent to which studies were adequately powered, randomization was successful (that is, it resulted in homogeneous study groups), baseline differences were statistically controlled for, and patients were lost to follow-up. Other predefined assessment criteria were study design, sample size, type of intervention, type of control, direction of effect (supporting or refuting the hypothesis), and type of result. Extracted data were entered into a custom-made spreadsheet. Differences between two independent assessors were settled by consensus. A meta-analytic approach was considered but was abandoned when the heterogeneity of the trials became apparent. Nevertheless, effect sizes averaged across each category of distant healing were included in an effort to provide some quantitative measure of the magnitude of clinical effects. Effect sizes were calculated by using Cohen’s *d* (18), weighted for sample size. The Hedges correction was applied to all effect sizes (19). In studies that reported multiple outcomes, a single outcome was chosen to calculate effect size if 1) a significant change after treatment was shown for that outcome or 2) that outcome was the primary outcome measure in studies that found several or no significant treatment effects. In the few cases in which the authors did not provide sufficient information with which to calculate Cohen’s *d*, the study was not included in the overall effect size.

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## Data Synthesis

Using our search methods, we found more than 100 clinical trials of distant healing. The principal reasons for excluding trials from our review were lack of randomization, no adequate placebo condition, use of nonhuman experimental subjects or nonclinical populations, and not being published in peer-reviewed journals. Twenty-three studies met our inclusion criteria (13, 20–41). These trials included 2774 patients, of whom 1295 received the experimental interventions being tested. Methodologic details and results of these trials are summarized in **Tables 1 to 3**.

The studies are categorized as three types: prayer, Therapeutic Touch, and other distant healing. How-

**Table 1. Randomized, Placebo-Controlled Trials of Prayer**

Author, Year (Reference)	Design	Sample Size	Experimental Intervention	Control Intervention*	Result	Comments	Jadad Score
Joyce and Welldon, 1965 (20)	Double-blind; 2 parallel groups	48 patients with psychological or rheumatic disease	Prayer in Christian or Quaker tradition; patients received 15 hours of daily prayer for 6 months	Usual care	No significant differences in clinical or attitude state	Inclusion and exclusion criteria not stated; heterogeneous patient groups; results of only 16 pairs available	5
Collipp, 1969 (21)	Triple-blind; 2 parallel groups	18 children with leukemia	Daily prayer for 15 months	Usual care	Higher death rate in control group, but difference was not significant ( $P = 0.1$ )	Heterogeneity of groups makes findings inconclusive; inclusion criteria not stated	4
Byrd, 1988 (23)	Double-blind; 2 parallel groups	393 coronary care patients	Prayer in Christian tradition; 3 to 7 intercessors per patient until patient was released from hospital	Usual care	Treatment group required less ventilatory support and treatment with antibiotics or diuretics	Outcomes combined into "severity score" to handle multiple comparisons; score was lower in treatment group	5
Walker et al., 1997 (24)	Double-blind; 2 parallel groups	40 patients receiving alcohol abuse treatment	Prayer for 6 months	Usual care	No treatment effect on alcohol consumption	Insufficiently powered	4
Harris et al., 1999 (39)	Double-blind; 2 parallel groups	990 coronary care patients	Remote intercessory prayer in Christian tradition for 28 days	Usual care	Significant treatment effects for summed and weighted coronary care unit score; no differences in length of hospital stay	No differences were observed when the summed scoring system developed in Byrd's study (23) was used; unclear whether baseline differences were adequately controlled for	5

\* A placebo was unnecessary because patients were unaware of whether prayers were made on their behalf.

ever, these classifications are not mutually exclusive. For example, the study of distant healing by Sicher and colleagues (13) included 40 healers, some of whom would describe what they did as prayer, and the study by Miller (22) described the intervention as both prayer and remote mental healing.

### Prayer

Of studies that met our inclusion criteria, five specifically examined prayer as the distant healing intervention (**Table 1**). In all five studies, the intervention involved some version of intercessory prayer, in which a group of persons was instructed to pray for the patients (there was no way to control for whether patients prayed for themselves during the study). Qualifications for being an intercessor varied from study to study. For example, in the trial by Byrd (23), intercessors were required to have an "active Christian life, daily devotional prayer, and active Christian fellowship with a local church." In the study by Harris and colleagues (39), those praying were not required to have any particular denominational affiliation, but they needed to agree with the statement "I believe in God. I believe that He is personal and is concerned with individual lives. I further believe that He is responsive to prayers for healing made on behalf of the sick."

In each of these studies, the intercessors did not have any physical or face-to-face contact with the

persons for whom they were praying. Instructions on how the intercessors should pray were fairly open-ended in most instances. For example, in the trial by Harris and colleagues (39), intercessors were asked to pray for a "speedy recovery with no complications and anything else that seemed appropriate to them" (39).

Two trials showed a significant treatment effect on at least one outcome in patients being prayed for (23, 39), and three showed no effect (20, 21, 24) (**Table 1**). The average effect size, computed for four of these studies, was 0.25 ( $P = 0.009$ ).

### Therapeutic Touch

Eleven trials examined the healing technique known as "noncontact Therapeutic Touch" (**Table 2**). A criterion for inclusion in our review was that the Therapeutic Touch intervention be compared to an adequate placebo, consisting of a mock or mimic Therapeutic Touch condition or a design in which patients could not physically observe whether a Therapeutic Touch practitioner was working on them. Of the 11 trials, 7 showed a positive treatment effect on at least one outcome (25, 27, 28, 30, 33, 34, 41), 3 showed no effect (26, 29, 31), and 1 showed a negative treatment effect (the controls healed significantly faster) (32) (**Table 2**). The average effect size, computed for 10 of the studies, was 0.63 ( $P = 0.003$ ).

**Table 2. Randomized, Placebo-Controlled Trials of Therapeutic Touch**

Author, Year (Reference)	Design	Sample Size	Experimental Intervention	Control Intervention	Result	Comments	Jadad Score
Quinn, 1984 (25)	Double-blind	60 patients in cardiovascular unit	Noncontact Therapeutic Touch for 5 minutes	Simulated or mock Therapeutic Touch	17% decrease in post-test anxiety scores in treatment group		2
Keller and Bzdek, 1986 (27)	Single-blind; 2 parallel groups	60 patients with tension headache	Noncontact Therapeutic Touch for 5 minutes	Mock Therapeutic Touch	Treated group showed pain reduction after trial	Treatment effects were no longer present at 4 hours of follow-up; however, when participants who used intervening therapy were removed from analysis, 4-hour changes became significant	3
Quinn, 1988 (26)	Single-blind; 3 parallel groups	153 patients awaiting open-heart surgery	Noncontact Therapeutic Touch for 5 minutes	Mock Therapeutic Touch; no treatment	No significant treatment effects	Negative findings suggest importance of eye and face contact	2
Meehan, 1992 (28)	Single-blind; 3 parallel groups	108 postoperative patients	Noncontact Therapeutic Touch for 5 minutes	Mock Therapeutic Touch; usual care (analgesic drugs)	Nonsignificant reductions in postoperative pain ( $P < 0.06$ ); treatment group showed reduced need for analgesic medication	Used conservative "intention-to-treat" analyses	3
Simington and Laing, 1993 (29)	Double-blind; 3 parallel groups	105 institutionalized elderly patients	Noncontact Therapeutic Touch with back rub for 3 minutes	Mock therapeutic touch with back rub; back rub alone	Lower levels of post-test anxiety observed in treatment group compared with back rub only	No differences between therapeutic touch and mock therapy; no pretest given	2
Wirth et al., 1993 (30)	Double-blind	24 participants with experimentally induced puncture wounds	Noncontact Therapeutic Touch (healer behind one-way mirror) 5 min/d for 10 days	No treatment (placebo not necessary)	More rapid healing in treatment group		4
Wirth et al., 1996 (32)	Double-blind; 2 parallel groups	38 participants with experimentally induced puncture wounds	Noncontact Therapeutic Touch (healer behind one-way mirror), 5 min/d for 10 days	No treatment (placebo not necessary)	No treatment effect in terms of healing of dermal wounds	Control group healed significantly faster than treatment group	3
Gordon et al., 1998 (33)	Single-blind	31 patients with osteoarthritis of knee	Noncontact Therapeutic Touch, 1 session/wk for 6 weeks	Mock Therapeutic Touch; usual care	Treatment group showed improvements in pain, health status, and function	No change in functional disability	3
Turner et al., 1998 (34)	Single-blind; 2 parallel groups	99 burn patients	Noncontact Therapeutic Touch for 5 days; time varied from 5 to 20 minutes	Mock Therapeutic Touch	Treatment group showed reductions in pain and anxiety and had lower CD8 <sup>+</sup> counts		3
Wirth et al., 1994 (31)	Double-blind crossover study	25 participants with experimentally induced puncture wounds	Noncontact Therapeutic Touch with visualization and relaxation	Visualization and relaxation without Therapeutic Touch	No treatment effect	Authors note that the number of healed wounds was insufficient to compare for analyses	4
Wirth, 1990 (41)	Double-blind	44 men with experimentally induced puncture wounds	Noncontact Therapeutic Touch (healer not visible to participants), 5 min/d for 10 days	Mock Therapeutic Touch	Treatment group showed accelerated wound healing at days 8 and 16		4

### Other Distant Healing

Seven studies examined some other form of distant healing (Table 3). Descriptions of these interventions included "distance or distant healing" (13, 37, 38, 40), "paranormal healing" (36), "psychokinetic influence" (35), and "remote mental healing" (22). Positive treatment effects were observed in four of the trials (13, 22, 35, 37), and three showed no significant effect of the healing intervention (36,

38, 40). Effect sizes were computed for five of the studies, resulting in an average effect size of 0.38 ( $P = 0.073$ ).

### Overall Effect Size

An overall effect size was calculated for all trials in which both patient and evaluator were blinded. Along with the four studies that were previously excluded because effect sizes could not be calcu-

lated, three additional trials were excluded because it was unclear whether the evaluator was blinded to the treatment condition. For the 16 remaining trials, the average effect size was 0.40 ( $P < 0.001$ ) across the three categories of distant healing (2139 patients). A chi-square test for homogeneity was significant ( $P = 0.001$ ), suggesting that the effect sizes were not homogeneous. Subgroup analysis revealed that effect sizes were homogeneous within the categories of prayer and other distant healing but not within the category of Therapeutic Touch studies. In this analysis, the “fail-safe  $N$ ” was 63; this value represents the number of studies with zero effect that there would have to be to make the effect size results nonsignificant. It suggests that the significant findings are less likely to be the result of a “file-drawer effect” (that is, the selective reporting and publishing of only positive results).

### Methodologic Issues

Owing in part to our stringent inclusion criteria, the methodologic quality of trials was fairly high; the mean Jadad score across all studies was 3.6. No

clear relation emerged between the methodologic quality of the studies and whether the results were for or against the treatment. There was a trend toward studies with higher quality scores being less likely to show a treatment effect, but this correlation was weak and not statistically significant ( $R = -0.15$ ;  $P > 0.2$ ).

Despite the fairly high average quality of the trials, the methodologic limitations of several studies (such as inadequate power, failure to control for baseline measures, and heterogeneity of patient groups) make it difficult to draw definitive conclusions. For example, the findings reported by Collipp (21) may have resulted from a randomization problem that produced heterogeneous patient groups (two of the eight controls had myelogenous leukemia, but no patient in the experimental group had this condition). In the study by Miller (22), the positive finding of decreased systolic blood pressure in the remote mental healing group is difficult to interpret owing to the failure to control for baseline use of blood pressure medication.

The Therapeutic Touch studies carried out by Quinn (25), Keller and Bzdek (27), Turner and

**Table 3. Randomized, Placebo-Controlled Trials of Other Distant Healing Methods**

Author, Year (Reference)	Design	Sample Size	Experimental Intervention	Control Intervention	Result	Comments	Jadad Score
Braud and Schlitz, 1983 (35)	Single-blind within and between participants	32 participants with high levels of autonomic arousal	Distant mental influence (intention to decrease arousal with ten 30-second sessions)	No-influence control conditions	10% reduction in galvanic skin response between control and influence sessions	No effect in participants with initially low galvanic skin response levels	3
Beutler et al., 1988 (36)	Double-blind; 3 parallel groups	120 patients with hypertension	Laying on of hands by 12 healers, 20 min/wk for 15 weeks	Healing at a distance; usual care	No treatment effect	Unclear what precisely the healers did; acute increase in diastolic blood pressure after laying on of hands	4
Wirth et al., 1993 (37)	Double-blind crossover study	21 patients with bilateral asymptomatic impacted third molar who were undergoing surgery	Distance healing (Reiki, LeShan) for 15–20 minutes 3 hours after surgery	No treatment (placebo not necessary)	Treatment group showed decrease in pain intensity and greater pain relief after surgery		4
Greyson, 1996 (38)	Double-blind	40 patients with depression	Distance healing (LeShan technique)	Usual care	No treatment effect	May have been underpowered	5
Sicher et al., 1998 (13)	Double-blind; 2 parallel groups	40 patients with AIDS	Distance healing (40 healers from different spiritual traditions; each patient treated by 10 healers)	Usual care (no placebo necessary)	Healing group had fewer new AIDS-defining illnesses, less illness severity, fewer physician visits and hospitalizations, and improved mood	Mood changes may have been due to baseline differences; no apparent statistical adjustment for multiple comparisons	5
Miller, 1982 (22)	Double-blind; 2 parallel groups	96 patients with hypertension	“Remote mental healing” in Church of Religious Science tradition	No treatment (no placebo necessary)	Decrease in systolic blood pressure in treatment group	Unclear how many participants were lost to follow-up; results given for only 4 of 8 healers; use of medication not controlled for	1
Harkness et al., (40)	Double-blind	84 patients with warts	6 weeks of distant healing (“channeling of energy”) by 10 healers	No treatment (no placebo necessary)	No significant treatment effect on size or number of warts	Seems that baseline values were not controlled for in analysis	5

colleagues (34), Gordon and associates (33), and Simington and Laing (29) all used single-blind methods in which the Therapeutic Touch practitioner knew whether he or she was using the actual or mock (placebo) treatment on patients. This design may have introduced bias. For example, practitioners may have consciously or unconsciously given off nonverbal cues (such as a different posture or facial expression) (14) or silently expressed higher levels of empathy to study participants that would indicate whether the treatment was actual or mock. However, blinded observers have been unable to differentiate actual noncontact Therapeutic Touch from the mock or placebo version of this therapy (33), suggesting that in these studies, the positive findings did not result from the introduction of such biases. As suggested by Quinn (26), another potential problem with the single-blind method that she and others have used is that an experienced and skilled Therapeutic Touch practitioner may in fact continue to unconsciously “manipulate energy” in some way (that is, actually perform Therapeutic Touch), thereby producing a therapeutic effect even though his or her conscious intention is to pretend to do the procedure.

In two of the methodologically better studies that examined prayer (23) and distant healing (13), the positive findings may have resulted from a failure to use a Bonferroni correction to adjust for multiple statistical comparisons. Byrd (23), in an effort to address this problem, combined the various treatment outcomes into a “severity score” in his study and the prayer treatment group had significantly lower severity scores. Targ (Personal communication) reported that in the study by Sicher and colleagues (13), post hoc analyses in which corrections for multiple comparisons were made did not alter their results.

In studies that failed to show a significant treatment effect, weaknesses in study design (such as inadequate sample sizes) may have increased the likelihood of a type 2 error (failure to reject the null hypothesis when it is in fact false). Post hoc analyses suggested that lack of statistical power may explain the negative findings in Walker and colleagues’ study of prayer (24) and Greyson’s study of distant healing (38).

Finally, in Simington and Laing’s (29) study of noncontact Therapeutic Touch in institutionalized elderly patients, the investigators did not collect pretest data to control for the possibility of a “testing” effect. However, without such data, it is impossible to know whether the randomization procedure actually produced homogeneous groups at baseline, which makes the post-test data difficult to interpret.

## Discussion

In our systematic review of 23 randomized, controlled trials of all forms of distant healing, 13 (57%) showed a positive treatment effect, 9 showed no effect, and 1 showed a negative effect. The numbers of prayer and distant healing studies with positive and negative findings were roughly equal, whereas a somewhat larger proportion of Therapeutic Touch trials (7 of 11) showed a significant treatment effect. Results of our quantitative analysis suggest that effect sizes were small (0.25 for prayer and 0.38 for “other” distant healing) to moderate (0.63 for Therapeutic Touch). An overall statistically significant effect size of 0.40 was found across all categories of distant healing (16 trials) in which both patients and evaluators were adequately blinded.

A major limitation of our review was the heterogeneity of the trials (both in terms of treatment and outcomes), which precluded formal quantitative analyses. Furthermore, despite our restrictive inclusion criteria, we identified several methodologic limitations in the trials that made qualitative interpretation of the findings difficult. Thus, the results of our review must be interpreted with caution.

Previous reviews of distant healing techniques have also had mixed results. For example, a recent review of Therapeutic Touch for wound healing found 5 studies (all by the same author) and concluded that “results are far from impressive... [and] inconsistent overall...” (42) (The Cochrane Collaboration is currently examining the evidence for Therapeutic Touch in wound healing [43]). However, a more recent meta-analysis of 9 randomized, controlled trials of Therapeutic Touch (44) concluded that Therapeutic Touch is more effective than mock Therapeutic Touch or routine clinical touch in reducing anxiety symptoms. In addition, a meta-analytic review of 13 trials (which differed from those included in our review owing to the inclusion criteria) found an average effect size of 0.39 (45). Our findings are in basic agreement with a recent Cochrane Collaboration systematic review (46) that included results of three of the prayer trials that we reviewed (20, 21, 23) and found no clear evidence for or against the incorporation of prayer into medical practice.

As noted, the scientific investigation of such techniques as prayer, energy healing, and psychic or distant healing is controversial. One might argue that at the very least, distant healing has a powerful placebo effect that could be used to benefit certain patients in clinical practice. This would be true if we could be certain that such techniques were devoid of serious adverse events. However, O’Mathuna (16) has suggested that this may not be the case. He notes that some of the original writings of the de-

velopers of Therapeutic Touch state that patients may be harmed if they are, for example, “flooded” with too much energy. This “overdosing” of energy may manifest as irritability, restlessness, anxiety, or increased pain. O’Mathuna acknowledges, however, that these potential negative side effects of Therapeutic Touch are only speculative and have never been scientifically documented. In arguing for the importance of obtaining full consent in distant healing studies, Dossey (47) notes that some evidence in the literature indicates that distant mental influence can cause harm in nonhuman biological systems; thus, prayer and energy healing may not always be benign.

Studies of prayer also raise certain philosophical issues (48), such as why a benevolent God or deity would respond only to the prayers of or on behalf of persons in the treatment group, when many persons in the control group will probably pray for themselves and will be prayed for by friends and loved ones. Similarly, why would a compassionate God or higher power who intends the well-being of all humankind respond only to the needs of those who pray or are prayed for?

Others find the scientific scrutiny of things religious and spiritual to be misguided and even potentially blasphemous; they ask, for example, how science could ever prove or disprove the existence of things that believers take as matters of faith. Although such reservations are duly noted, we believe that there is no compelling reason why the scientific method cannot be applied to such areas as distant healing and prayer and that doing so will only further our knowledge about the potential value of these approaches in health and in life. In the words of a leading researcher in this field (48),

No experiment can prove or disprove the existence of God, but if in fact [mental] intentions can be shown to facilitate healing at a distance, this would clearly imply that human beings are more connected to each other and more responsible to each other than previously believed. That connection could be actuated through the agency of God, consciousness, love, electrons, or a combination. The answers to such questions await further research.

### **Directions for Future Research in Distant Healing**

As noted earlier, the studies of distant healing reviewed here have several methodologic limitations. We highlight some of the difficulties inherent in research on distant healing and offer some suggestions that might help guide future investigations into these areas.

First, as noted by both critics and proponents of distant healing, it is difficult to obtain “pure” control groups in distant healing research. For example, in prayer studies, particularly those involving very ill

patients, the controls who are not being experimentally prayed for or sent healing intentions as part of the study are likely to nonetheless receive prayers and positive mental intentions from friends, loved ones, and others. We concur with Dossey (47) and others who have suggested that one solution to this seemingly unavoidable methodologic problem in such research is to carry out distant healing studies on nonhuman populations (such as animals or bacteria). The findings of controlled trials of distant healing (12) in nonhuman biological systems are provocative enough to merit further research.

Second, we agree with Targ (14), who has suggested that future studies of prayer and distant healing should more carefully measure psychological factors (such as depression, anxiety, sense of control, and self-efficacy) that are known to interact with physical health outcomes.

Third, as noted, the negative findings in many of the healing studies we reviewed may have resulted from inadequate sample sizes and insufficient statistical power. However, well-designed randomized, controlled trials of prayer and distant healing with significantly larger samples (more than 1000 patients) are in progress at several institutions (46, 49).

Fourth, in an effort to explain some of the negative findings in distant healing research, it has been suggested that blinding to assignment in randomized, controlled trials might block receptivity to “healing energy” by generating uncertainty in patients (47). Carrying out studies in nonhuman populations would, in theory, be one way to minimize this methodologic issue. Another way to test this theory would be to inform experimental and control patients that they will be receiving the distant or spiritual healing and then directly examine the extent to which patients’ beliefs or “receptivity” influence study outcomes. However, ethical considerations of informed consent might make this design difficult to implement. Yet another possibility would be to design randomized, controlled trials with non-randomized “preference arms” that would allow evaluation of the effects of randomization as opposed to choice.

Finally, it has been suggested (50–52) that previous (skeptical) beliefs of trial volunteers or investigators—the “experimenter effect”—might contribute to unsuccessful outcomes (that is, if mental intentions influence physical matter in some way, the investigators’ or patients’ negative beliefs about healing could directly affect study outcomes). Again, such a hypothesis could, in theory, be empirically tested by having investigators who are skeptical of and believers in spiritual healing conduct the same trials and assess whether in fact such beliefs influence outcomes (52).

## Conclusions

Despite the methodologic limitations that we have noted, given that approximately 57% (13 of 23) of the randomized, placebo-controlled trials of distant healing that we reviewed showed a positive treatment effect, we concur with the summary conclusion of the Cochrane Collaboration's review of prayer studies that the evidence thus far warrants further study (46). We believe that additional studies of distant healing that address the methodologic issues outlined above are now called for to help resolve some of the discrepant findings in the literature and shed further light on the potential efficacy of these approaches.

From University of Maryland School of Medicine, Baltimore, Maryland; and University of Exeter, Exeter, United Kingdom.

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**Requests for Single Reprints:** John A. Astin, PhD, Complementary Medicine Program, Kernan Hospital Mansion, 2200 Kernan Drive, Baltimore, MD 21207-6697; e-mail, jastin@compmed.ummc.umaryland.edu.

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**Current Author Addresses:** Dr. Astin: Complementary Medicine Program, Kernan Hospital Mansion, 2200 Kernan Drive, Baltimore, MD 21207-6697.

Ms. Harkness and Dr. Ernst: Department of Complementary Medicine, University of Exeter, 25 Victoria Park Road, Exeter EX2 4NT, United Kingdom.

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